Standard Spacecraft User Application Services

By Joseph F. Smith, Jet Propulsion Laboratory, California Institute of Technology

The Consultative Committee for Space Data Systems (CCSDS) has developed standards that allow interoperability of spacecraft and the interchange of spacecraft data between the member space agencies. CCSDS is best know for its standards for packet telemetry and packet telecommand. Now, CCSDS is branching out to provide new standards for the interchange of information, and the interconnection of subsystems and devices onboard of a spacecraft. This effort is know as Spacecraft Onboard Interface (SOIF). SOIF is intended to publish standards that will allow for the enhanced reuse of spacecraft equipment and software. SOIF expects that these standards will be well known and used with the space community, and that they will be based on or similar to the well known Internet protocols. The SOIF subpanel is also defining two services that are intended to meet the very special needs of spacecraft flight environment: the command and data acquisition (C&DA) service and the time distribution service. The C&DA service that is intended for the communications to and from simple engineering sensors and effectors. This paper will define this proposed service, show how it integrates into the larger SOIF structure, and a possible evolutionary path for the service over the course of the next few years. Three cases will be used to illustrate how the C&DA service works, when communicating with a local device (connected to the local box), to a device attached to another box on the same subnet, and a device attached to a box on another subnet. This paper will also review the present thinking on the time distribution service. This service will be used to maintain the synchronization between the different computer clocks that are spread around the spacecraft.